

August 17, 2011

HGM Associates, Inc.
640 5th Avenue
Council Bluffs, Iowa 51502

Attention: Mr. Terry Smith, P.E.

Re: Interim Report - Results of Global Stability Analyses Revisions
South Ash Containment Pond Embankments
Riverside Generating Station
Bettendorf, Iowa
Terracon Project No. 07105081/02105081G

Dear Mr. Smith,

As requested, Terracon Consultants Inc. (Terracon) has revised our global stability analyses for the South Ash Containment Pond Embankments under Steady State Seepage conditions. To meet a minimum factor of safety of 1.5 under Steady State Seepage conditions as required by USACE embankment dam criteria, we recommended performing additional exploration during construction of the slope face remediation to better define the geometry and characteristics of the original 1968 embankment materials present beneath the toe of the embankments (reference out May 26, 2011 correspondence). To date, three (3) of the additional four (4) borings planned to augment the subsurface data have been completed. The fourth boring will be completed once the contractor has provided access to the final boring location. This letter presents our opinions based on the additional information from the three (3) supplemental borings performed to date. A complete revision of the geotechnical report for the project will be submitted upon completion of the final boring.

Our December 7, 2010 geotechnical report for the project indicated the global stability factor of safety of the embankments under conditions of Steady State Seepage ranged from 1.42 to 1.51 for the five sections analyzed. These results were particularly impacted by the limited information available regarding the geometry and material characteristics of the original 1968 construction. Therefore, our analyses included conservative estimates of the geometry and material characteristics for the original 1968 embankment construction located within and beneath the toe of the existing embankment (refer to Sections 3.2, 3.4 and 3.7 of our December 7, 2010 report). Borings performed for the project at that time did not penetrate these zones as they were performed from the crest of the embankments. In particular, the geometry of the original 1968 construction was estimated from limited historical drawings and MEC construction cost estimate data available. Characteristics of this zone and the alluvial river bed material presumed to be present beneath the original 1968 dike were estimated based on the limited available information.



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The three (3) borings completed to date have shown that our original estimates of the geometry and material characteristics were conservative. The supplemental borings indicate the original 1968 embankment extended deeper than originally estimated with little to no native river bed alluvium present beneath the rip rap section.

Based on the information obtained from the supplemental borings, the subsurface stratigraphic models used in the global stability analysis were revised to reflect the conditions encountered at those locations and we have reanalyzed the embankment stability under Steady State Seepage conditions. The revised analyses for the referenced sections indicate the factor of safety under Steady State Seepage conditions ranges from 1.57 to 1.62 at the five design sections. These values exceed the minimum required factor of safety of 1.5 required for embankment dam safety criteria for the Steady State Seepage condition. Based on these results, no additional remediation of the embankment sections beyond that being currently performed to increase the stability of the riverside slopes appears necessary.

As previously discussed, one (1) planned boring has yet to be performed due to the contractor's staging schedule. Our final evaluation of Section E is contingent on completion of the remaining boring.

We appreciate the opportunity to be of further service to you on this project. If you have any questions regarding this letter, please contact us.



Sincerely,
Terracon Consultants, Inc.

Kathleen E. Jost

601 Steven M. Levorson, Ph.D., P.E.
Senior Consultant

Vaughn Rupnow

Vaughn Rupnow, P.E.
Iowa No. 19259

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.	
	 Vaughn Rupnow, P.E.	<u>8/17/2011</u> Date
My license renewal date is December 31, 2012.		

August 19, 2011

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Attention: Mr. Terry Smith, P.E.

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Riverside Generating Station
Bettendorf, Iowa
Terracon Project No. 07105081/02105081G

Dear Mr. Smith,


As requested, Terracon Consultants Inc. (Terracon) has performed a fourth boring in order to revise our global stability analyses for the South Ash Containment Pond Embankments under Steady State Seepage conditions. The boring was completed on August 19, 2011 and encountered one (1) foot of alluvial soils beneath the original 1968 embankment. Similar conditions were encountered at other supplemental boring locations, which resulted in factors of safety under Steady State Seepage conditions ranging from 1.57 to 1.62 at the five design sections. Although final analyses have not been completed for Section E, based solely upon the stratigraphy encountered at the boring location, we anticipate that factors of safety will exceed the minimum factor of safety of 1.5 under Steady State Seepage conditions as required by USACE embankment dam criteria. A complete revision of the geotechnical report for the project will be submitted upon completion of the analyses.

We appreciate the opportunity to be of further service to you on this project. If you have any questions regarding this letter, please contact us.

Sincerely,
Terracon Consultants, Inc.



Vaughn Rupnow, P.E.
Iowa No. 19259



Cale J. Wilson, P.E.
Iowa No. 19502



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